Procedures and Guidelines

DIRECTIVE NO. 400-PG-1410.2.1A
EFFECTIVE DATE: 02/23/00
EXPIRATION DATE: None

APPROVED BY Signature: Original Signed by:
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Title: CONFIGURATION CONTROL

P1. PURPOSE

This Procedure and Guideline (PG) establishes configuration management (CM) requirements for the Goddard Space Flight Center (GSFC) Flight Programs and Projects Directorate (FPPD). It addresses FPPD-unique requirements for implementing GPG 1410.2.

P2. REFERENCES

GPG 1410.1 Directives Management
GPG 1410.2 Configuration Management
GPG 1440.7 Control of Quality Records
GPG 5310.4 Identification and Traceability of Products

P3. SCOPE

This document applies to all FPPD programs and projects.

P4. DEFINITIONS

a. Customer – Any organization or person who will receive a product or service from GSFC. Unless otherwise defined in the QMS, the customer is assumed to be external to GSFC.
b. Centralized Configuration Management System (CCMS) – a computerized system provided for users to maintain some or all of their CM records. Usage of this system is optional.

P5. AUTHORITIES AND RESPONSIBILITIES

The FPPD shall designate a Directorate CMO who will coordinate the directorate's CM activities. The Directorate CMO will also coordinate and manage the use of the CCMS within the FPPD.

Program managers are responsible for ensuring effective CM in each program's projects.

Project managers will fulfill the responsibilities identified for organization heads in GPG 1410.2. Project managers will each designate a Configuration Management Officer (CMO) responsible for oversight and coordination of project CM activities. If the project chooses to use the CCMS, the CMO or his/her designee(s) will be responsible for proper utilization of the system by the project. It is the mutual responsibility of document originators and CMOs to ensure that copies of each original and/or revised document and approved changes are included in the appropriate library.

The Systems Assurance Manager is responsible for ensuring change implementation by hardware/software verification. The Contracting Officer is responsible for reviewing all proposed changes that have a potential impact to their assigned contracts. The Financial Manager is responsible for reviewing all proposed changes and evaluating the impacts of their costs.

P6. CANCELLATION

This document cancels and replaces 400-PG-8700.2.1.

P7. QUALITY RECORDS

This document requires no specific Quality Records. Program offices may establish Quality Record requirements for their respective projects. Project offices will determine the records necessary for effective CM, over and above any specified by the respective program office. If a project's procedures require Quality Records not required in the program offices procedures or GPG 1410.2, the project's CM procedure shall be issued as a directive as required by GPG 1440.7. Normally, CM records need not be Quality Records except as specified in GPG 1410.2.

1. PROGRAM/PROJECT IMPLEMENTATION

1.1 CONFIGURATION MANAGEMENT PROCEDURES

1.1.1 Program CM Procedures

Program offices will establish CM requirements for the projects within their programs. Program office CM procedures shall be issued as directives (see GPG 1410.1), except for those cases where the program office and project office(s) are a single office (e.g., GOES, POES, etc.) requiring no specific Quality Records. A program CM procedure may delegate some or all definition of CM procedures to projects, but program offices are urged to sufficiently define the requirements such that the need for individual project(s) procedures is minimized.

Program CM procedures are required to be signed and available 30 days after the effective date of this document.

1.1.2 Project CM Procedures

Every FPPD project is required to have approved CM procedures in place. A project should begin to establish the CM procedures during or before the Project Implementation sub-process. For new projects, the approved project plan or Request For Proposal of deliverables should be the basis for the start of CM baselining.

A project office may adopt the procedures established by the program office, when the program office's procedures adequately address the project's CM requirements as defined in GPG 1410.2. Projects

requiring practices in addition to those required in program CM procedures shall document their own procedures as controlled documents, and as directives when Quality Records are required.

1.2 CONFIGURATION IDENTIFICATION

1.2.1 Identification (e.g., numbering) conventions to be applied to documents. Document identification numbers shall be assigned to all controlled documents. The responsibility for assignment of document numbers will be defined in program or project CM procedures.

Projects establishing their document numbering systems after the effective date of this document shall use a numbering system that uses the organization code as its first characters. In these cases, the numbering system shall be compatible with the GSFC Centralized CM System.

1.2.2 Identification of product. Product identification requirements shall be identified in program and/or project documents, and shall be in accordance with GPG 5310.4.

1.2.3 Identification of contractor items. Each contractor responsible for design and/or fabrication shall be responsible for assigning contractor-unique document, drawing, and product identifiers, for submittal as a result of contractual requirements. The contractor's numbering system shall be subject to approval by the project. This requirement is effective for all contracts issued after the effective date of this directive.

1.3 ESTABLISHMENT OF CONFIGURATION BASELINES

The requirements baseline will be established as soon as practicable. A project requirements baseline is to be established before contract award, if a contract is issued.

Configuration baselines are established at major project milestones, as follows:

a. A project requirements baseline is established at contract award.

b. A design baseline is established at the PDR.

c. A development baseline is established at the CDR.

d. A product baseline is the final as-built configuration of a delivered CI.

Exceptions to this may be defined in program or project CM procedures.

1.4 CONFIGURATION CHANGE REQUESTS (CCRs)

Projects may use their own CCR form, or use or modify the generic GSFC Form 4-35 as described in GPG 1410.2. Existing project-unique CCR forms need not be revised solely for the purpose of incorporating the CCR requirements of GPG 1410.2.

CCRs shall be supported by sufficient technical, cost, and schedule data for the CCB to evaluate the merits of the change. Document CCR requirements shall be those required to clearly identify and

evaluate proposed new issuances and changes. Product CCR's should contain the following information as a minimum:

a. Complete technical description of the proposed change(s), including specific referenced document(s) and document rewording necessary to effect the change.

b. Complete rationale for change.

c. Schedule for completion, anticipated impact on the overall schedule, and the reason therefore.

d. Cost and delivery impact.

e. Effectivity (e.g., specific documents and/or hardware affected).

f. Change priority: routine, urgent, or emergency.

g. Procurement requires the "Procurement Change Order Classification."

1.5 SEPARATION OF CLASS I AND CLASS II CHANGES

Where a program or project chooses separate processes for Class I and Class II changes, program and/or project procedures shall define the processing requirements.

1.5.1 Class I changes. Class I shall be submitted for CCB approval and will be limited to those which are necessary or offer significant benefit to the Government. A change shall be classified Class I when one or more of the items listed below is affected:

a. Baselined documentation (except for typographical errors, clarification, or other examples of Class II documentation changes), including release of new controlled documents.

b. Technical requirements contained in the product CI (form, fit, or function).

c. Contract end items/requirements (cost or schedule).

1.5.2 Class II changes. Class II changes normally do not require project CCB approval unless they are written against project CM-controlled documents. A change may be classified Class II when it does not fall within the definition of a Class I change as given above. Examples of Class II changes are:

a. A change in documentation only (for example, correction of errors, addition or clarifying notes or views).

b. A minor change in hardware (for example, substitution with an approved alternative material) which does not affect any item listed under Class I changes.

c. Drawing changes that do not affect a baseline, interface, etc.

1.5.3 Evaluation. Class I CM actions are initiated and processed through the CCB by CCR. Anyone may initiate a CCR and forward it directly to the CMO. The CMO enters new CCR's into a log and/or CM database, reviews the CCR for completeness and accuracy and ensures review of the CCR by the appropriate project personnel. When a CCR is ready for CCB action, the CMO publishes CCB meeting notice. The CCB chairperson will approve or disapprove the change after consideration of CCB member recommendations. The status of all CCR's is tracked and reported through their completion by the CMO.

Changes to CM-controlled documentation will be released and distributed upon approval. Disapproved CCR's are returned to the originator, with direction for further action, if required.

1.5.5. CCR's requiring customer approval. Providing customer notification and obtaining approval are responsibilities of the CCB chairperson. The customer must be able to participate in any CCB action affecting the final deliverable product. All CCR's judged to require customer approval shall be categorized as Class I.

1.5.6 DOCUMENTATION OF CCR APPROVAL/DISAPPROVAL

All CCB directives will be signed by the CCB chairperson. All CCB decisions, recommendations, and action items will be recorded and maintained as defined in program/project-specific documentation. The closed CCR shows the approval/disapproval and may have supporting attachments as necessary.

1.5.7 IMPLEMENTATION AND VERIFICATION OF CHANGES

1.5.7.1 Implementation. Approved changes may be implemented via Engineering Orders, Change Notices, document revisions, contract changes, or other means, depending on the type of documentation affected (e.g., document, specification, or drawings).

1.5.7.2 Verification. The project shall formally verify the incorporation of approved hardware changes and shall ensure that all approved software changes are implemented.

Hardware verification consists of:

a. Ensuring that approved engineering changes are incorporated into engineering, manufacturing, and/or source inspection requirements.

b. Ensuring that engineering changes are incorporated into each item in accordance with the released engineering documentation and manufacturing orders.

c. Ensuring that engineering changes are incorporated into all engineering release records and operation and logistics documentation affected, and that required retrofit action is properly completed.

d. Ensuring that engineering changes are incorporated in supplier purchase orders and the List of Materials.

e. Ensuring that certification documents have been provided for hardware when used on space flight items and in critical ground support applications.

f. Notifying the CMO that changes have been fully implemented.

Software verification consists of ensuring that:

a. All software code changes have been analyzed for completeness.

b. Only approved changes are incorporated into the software code.

c. Approved changes are properly incorporated into the software code.

d. All documentation changes have been properly incorporated.

e. Any affected software modules will be loaded, compiled, and linked to ensure no complications are present.

f. Revised software code has been released.

g. Software used for formal testing is generated from controlled masters.

h. The software version number is updated.

2. CONTRACTOR CM

2.1 CM procedures for subcontractor designs. Contractors, suppliers, and vendors are responsible for controlling their own documentation. The methods they use for controlling that documentation must meet the contractor's established requirements or project contract requirements. See paragraph 1.2.3.

2.2 Changes processed from contractors begin through the contractor's internal change process. Contractor-approved changes will be submitted to the NASA representative or Defense Contract Administrative Services for concurrence in classification. A copy of all Class I changes shall be submitted to GSFC for approval. Upon the receipt of the change request, the CMO will log in the change, prepare a covering CCR, and start it through the change process.

Class II changes may be implemented when the Government representative agrees with the Class II classification. Class II changes should be delivered to the GSFC for information if drawings and documentation are delivered as part of the contract.

CHANGE HISTORY LOG

Revision	Effective Date	Description of Changes
Baseline	1/8/99	Baseline document, numbered 400-PG-8700.2.1
A	02/23/00	Complete rewrite to accommodate provisions of GPG 1410.2. Deleted subjects explicitly covered by GPG 1410.2. Changed document number from 400-PG-8700.2 to 400-PG-1410.2.1.